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20% More Eelgrass *(Zostera marina)* by 2020; Restoration Site Selection and Testing, and Resolving Regulatory and Social Barriers to Conservation and Recovery

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Sequim, WA

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Project Team

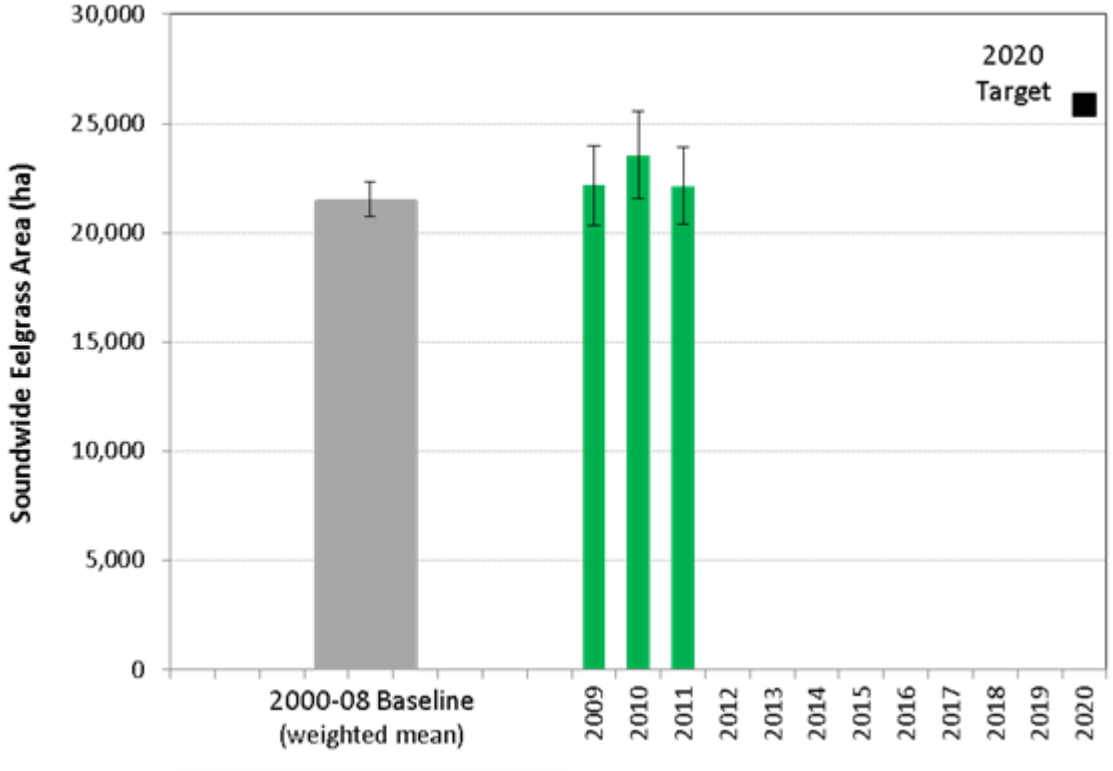
The Washington Department of Natural Resources (DNR) sponsors our project. This project is lead by scientific staff at DNR who presently conduct the eelgrass monitoring and research program within DNR. The Marine Sciences Laboratory of the Department of Energy's Pacific Northwest National Laboratory is a major partner with DNR for this work.

- DNR – Jeff Gaeckle, Helen Berry, Fred Short
- EPA – Jim Kaldy
- PNNL – Ron Thom, John Vavrinec, Amy Borde, Kate Buenau, Lyle Hibler, Dana Woodruff, Chaeli Judd, Lara Aston, Tarang Khangaonkar, and Wen Long

Puget Sound Marine and Nearshore Protection and Restoration Grant Program

Rationale

In response to the regional and global need, the Puget Sound Action Agenda specifically targets the restoration of 20% more eelgrass by 2020 (PSP 2012).



Rationale

Our project is part of the Action Agenda's strategy to "implement a coordinated strategy to achieve the 2020 eelgrass recovery target"(PSP 2012).

- **Strategy B2.4 Near-Term Action 1**: Identification of Eelgrass Restoration Sites: DNR will identify and recommend sites that are suitable for eelgrass restoration in Puget Sound. Sites will be selected using habitat suitability analysis, hydrodynamic modeling, and eelgrass resilience to local stressors. This will include identification of sites on state-owned aquatic lands with a focus on areas with long-term protections already in place.

Project Objectives

Overall goal: locate sites within Puget Sound and the Strait of Juan de Fuca suitable for successful eelgrass (*Zostera marina*) meadow restoration, with specific focus to identify sites that would be conserved from future anthropogenic disturbances and resilient to climate change.

- Assess through modeling and field studies potential sites for eelgrass restoration
- **Through discussions with local and regional planners evaluate and recommend potential management actions to restore and conserve eelgrass**
- Produce maps and characterize the projected increase in eelgrass areal extent that provide specific location for eelgrass restoration
- Deliver recommendations on suitable transplant sites and management actions to restore 20% more eelgrass in Puget Sound

Modeling

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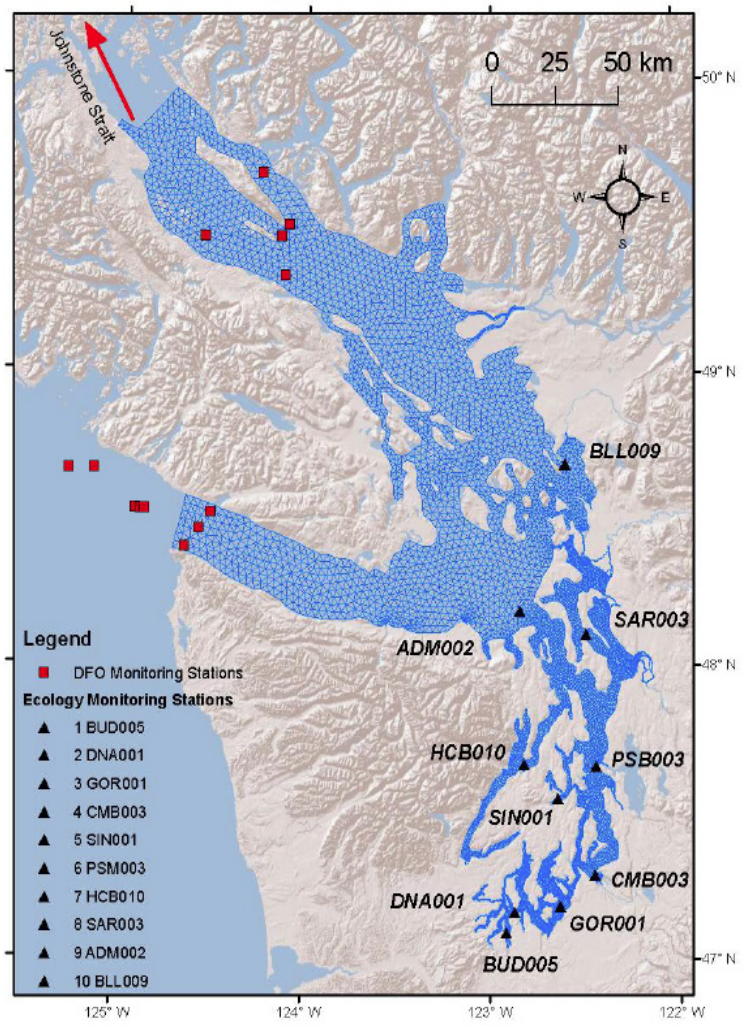
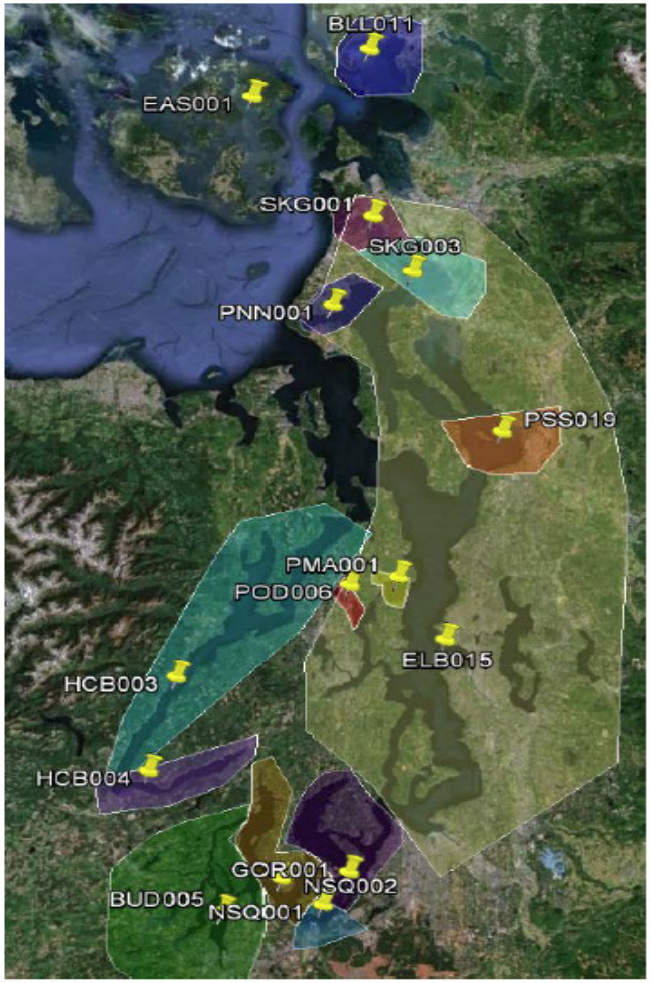
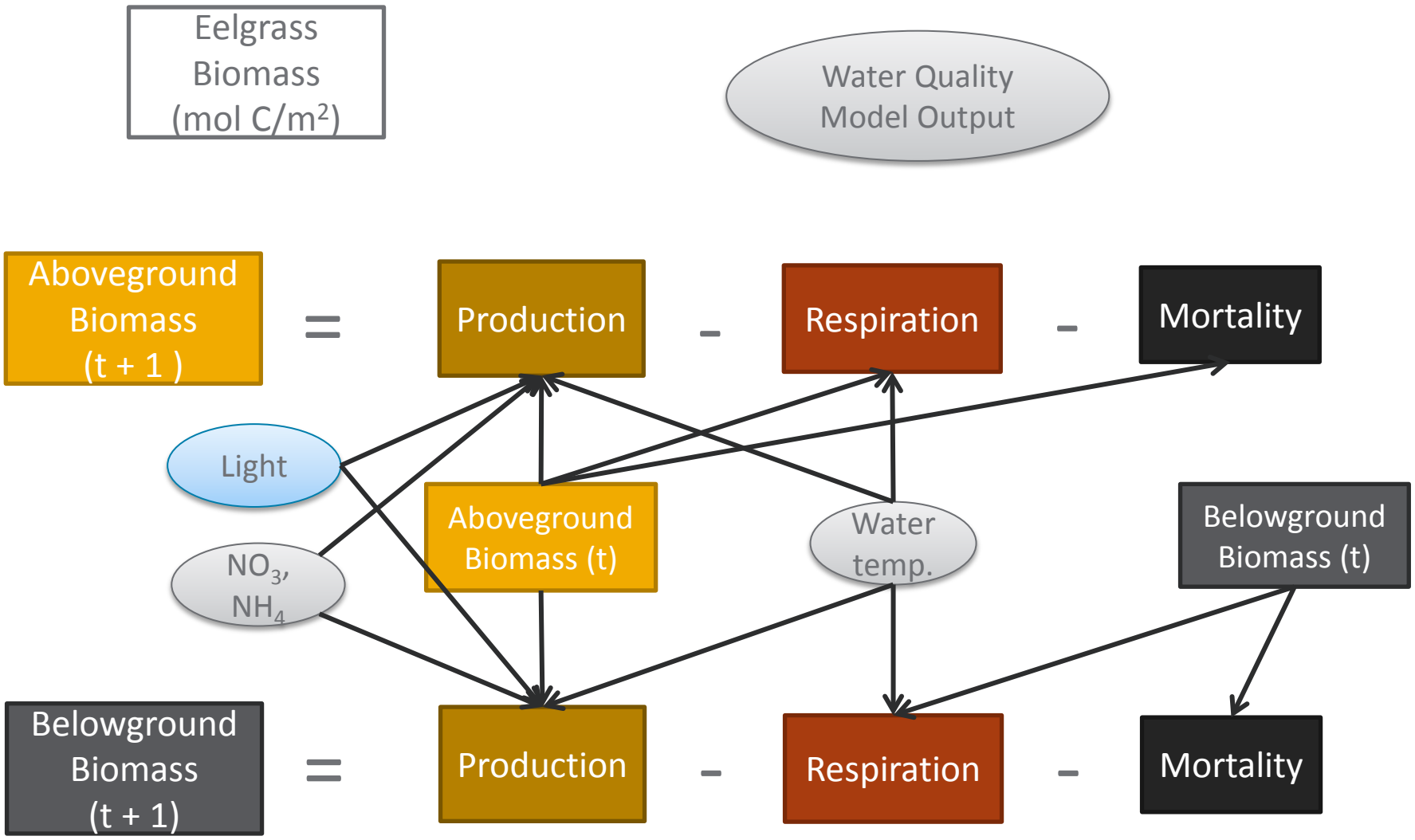
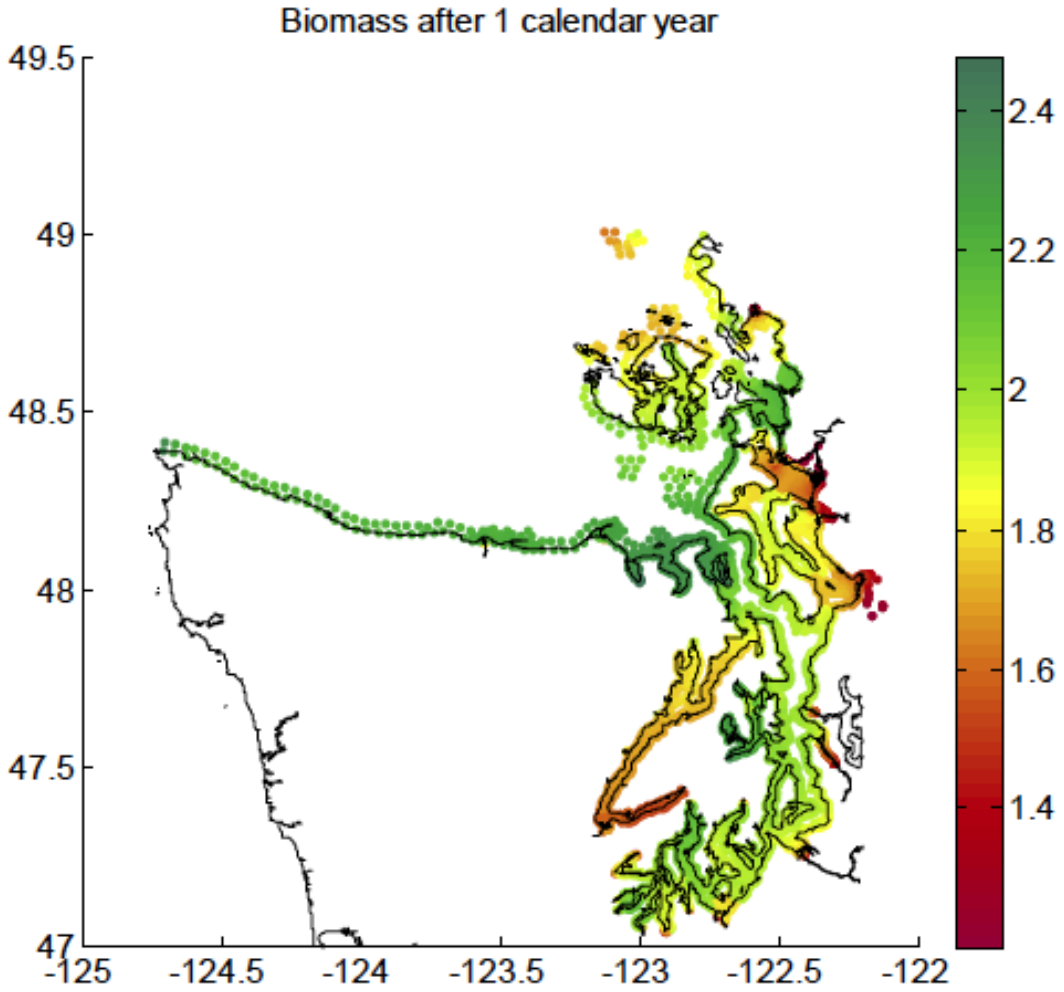


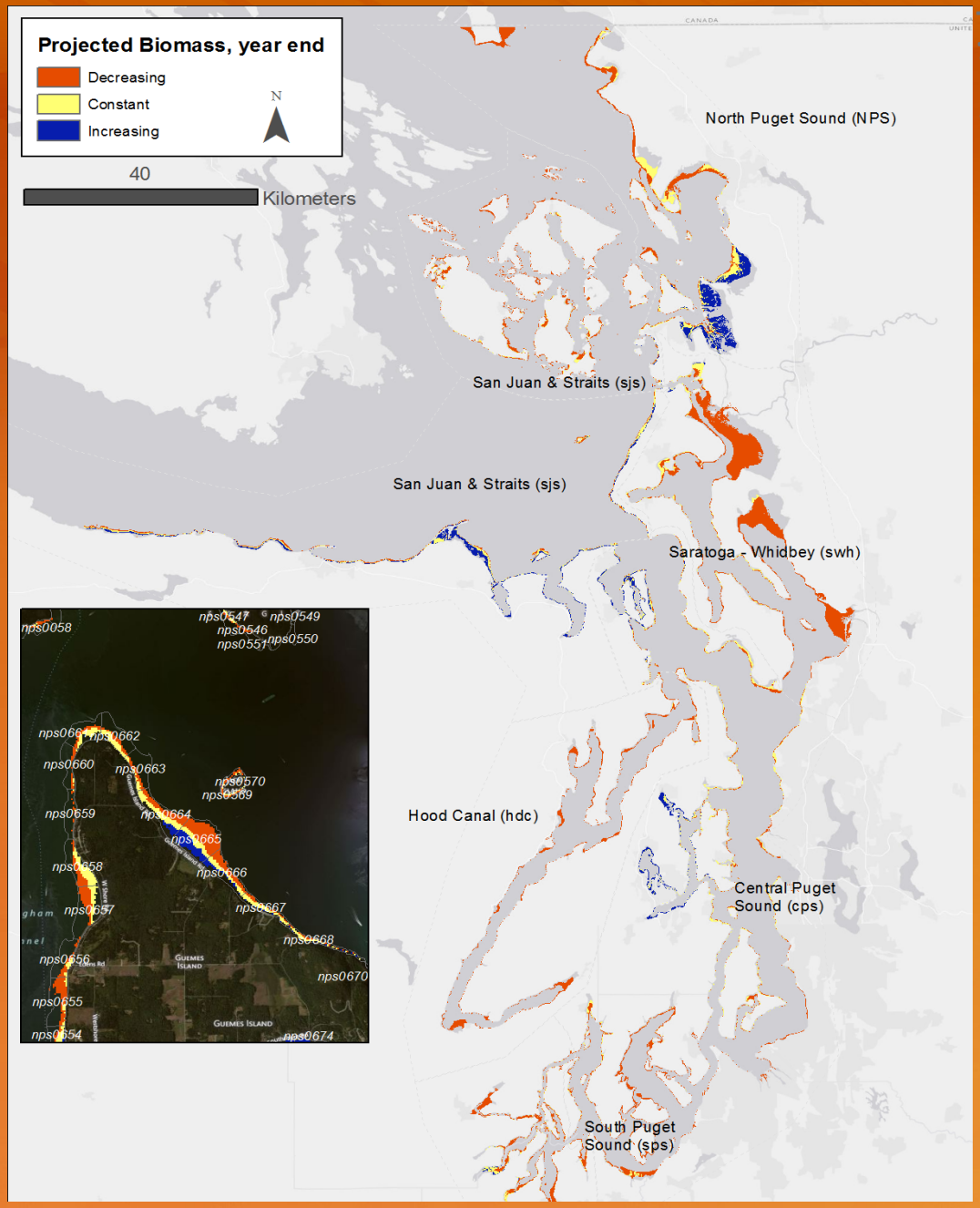


Eelgrass Biomass Model



Eelgrass Biomass Model





Similar measures

potential

Area Increasing /Constant biomass per site

Total area in the correct depth range

Is it restoration?

Historical Eelgrass Presence

Has eelgrass been present at site in the past?

DNR current surveyed areas

Is it there currently?

DNR current surveyed areas

Does % cover Seem light?

Other limits?

Erosion Index (USGS)

Stress Level (NOAA)

Identify potential areas for restoration

Field Visit to Areas of Interest

San Juan Islands

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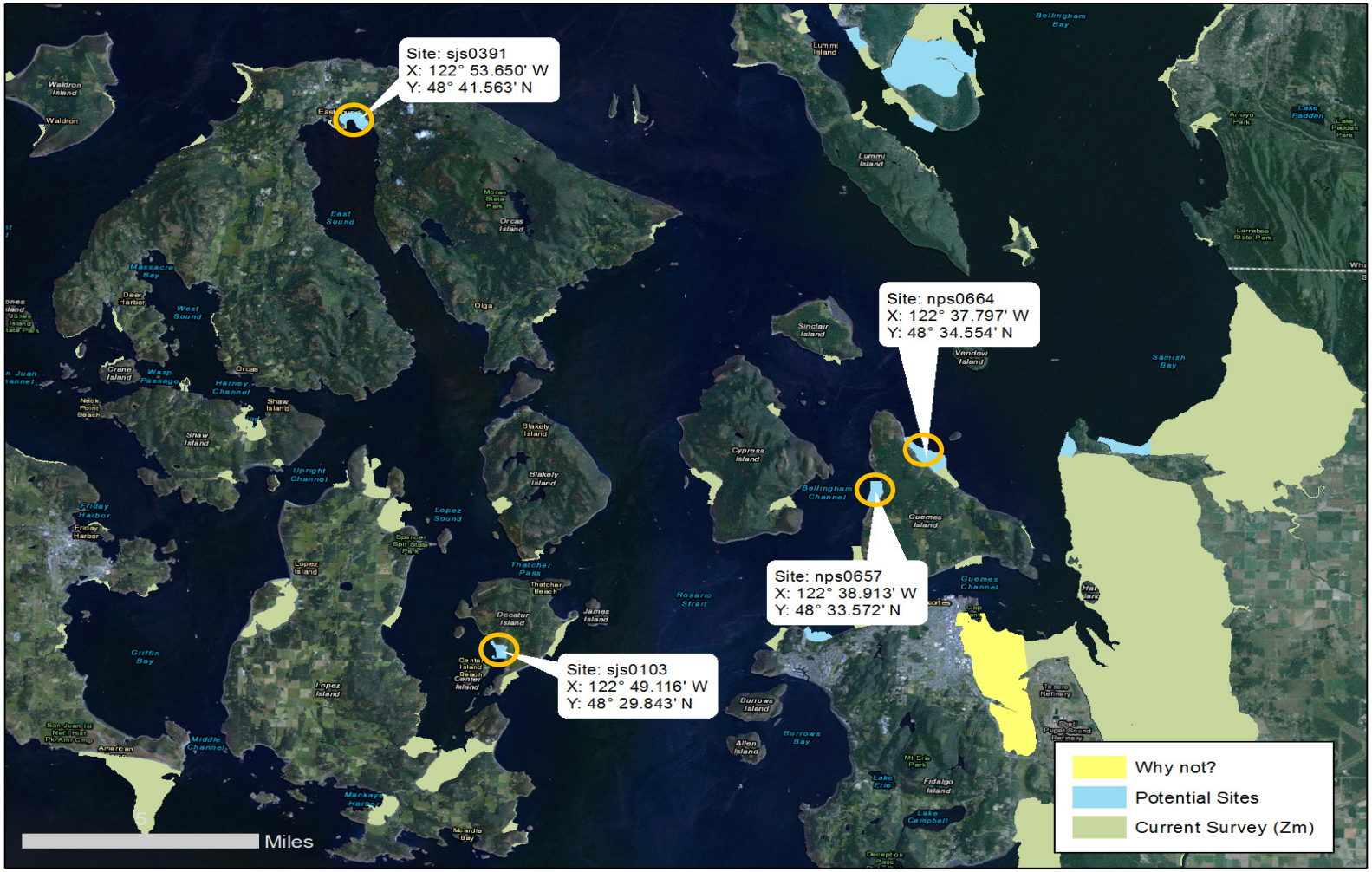

Whidbey Island

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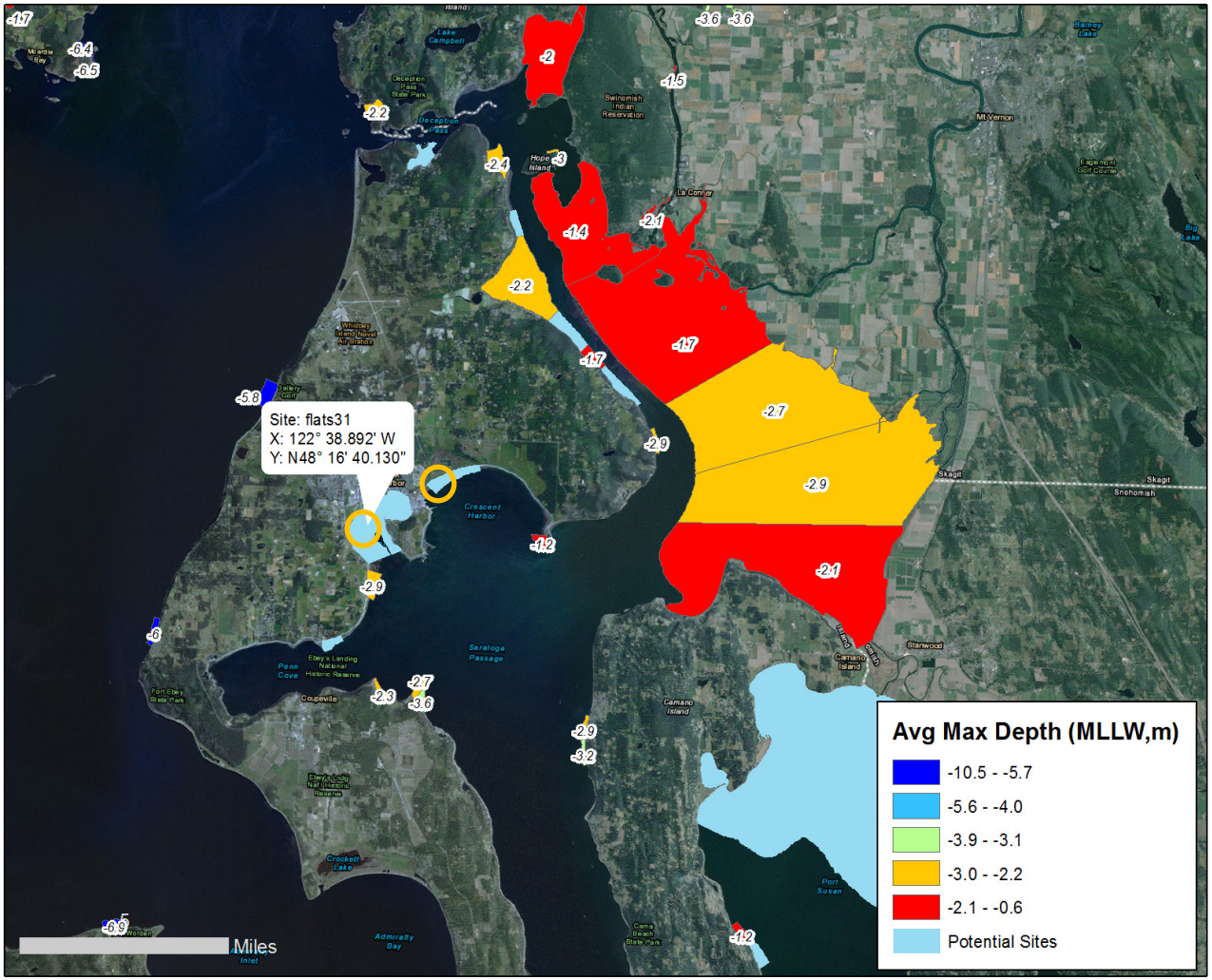

Hood Canal – Strait of Juan de Fuca

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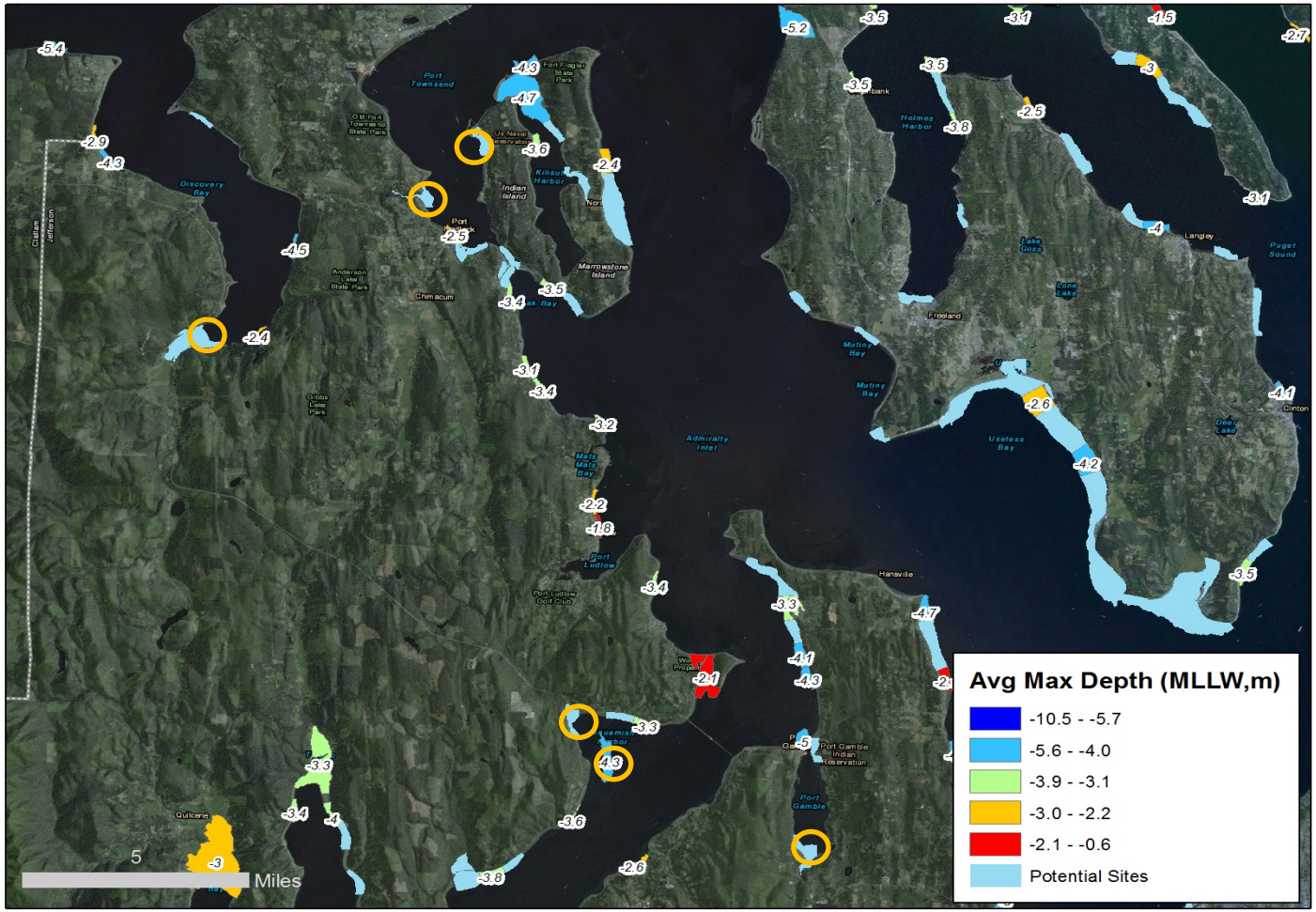

East Kitsap County

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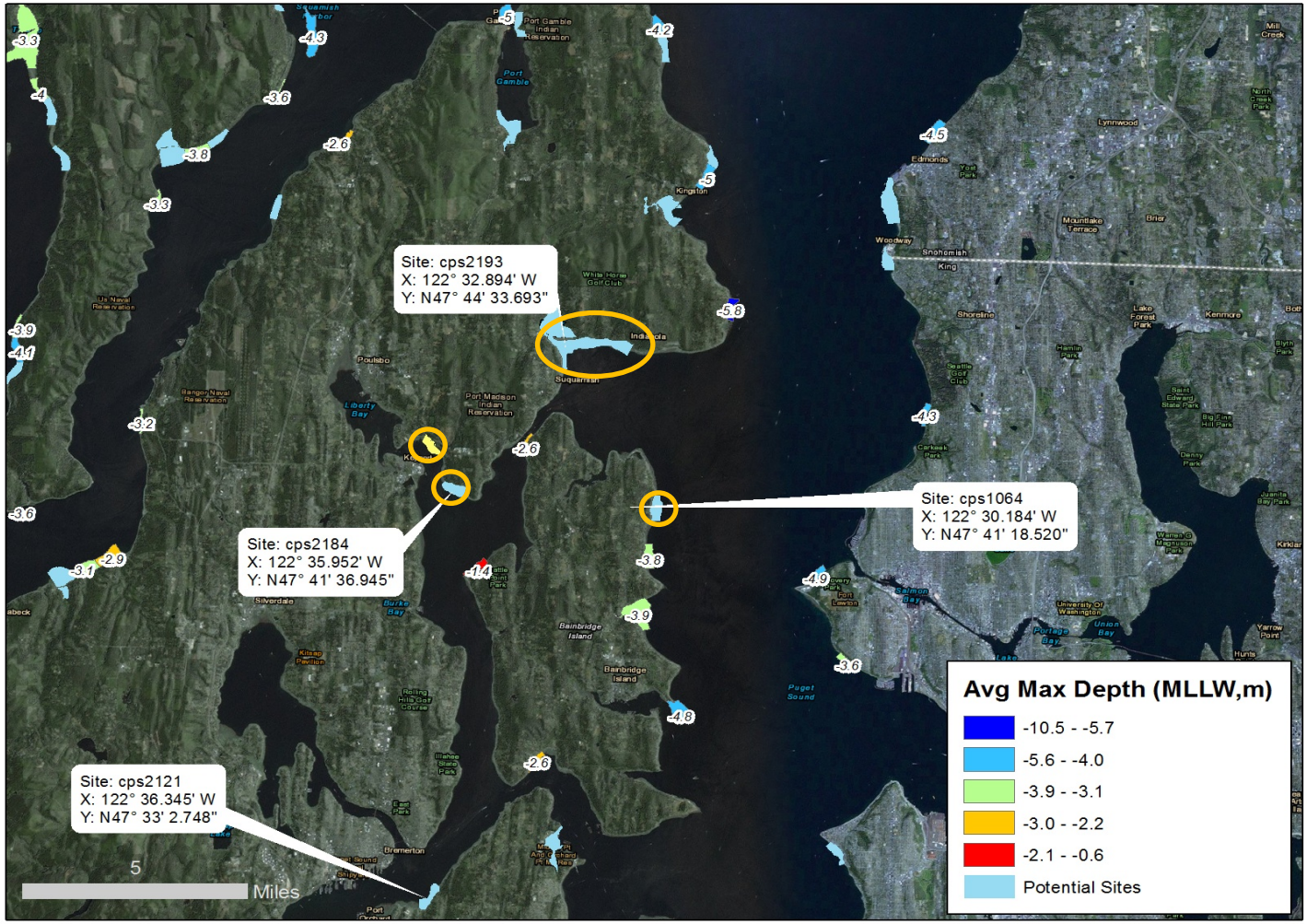
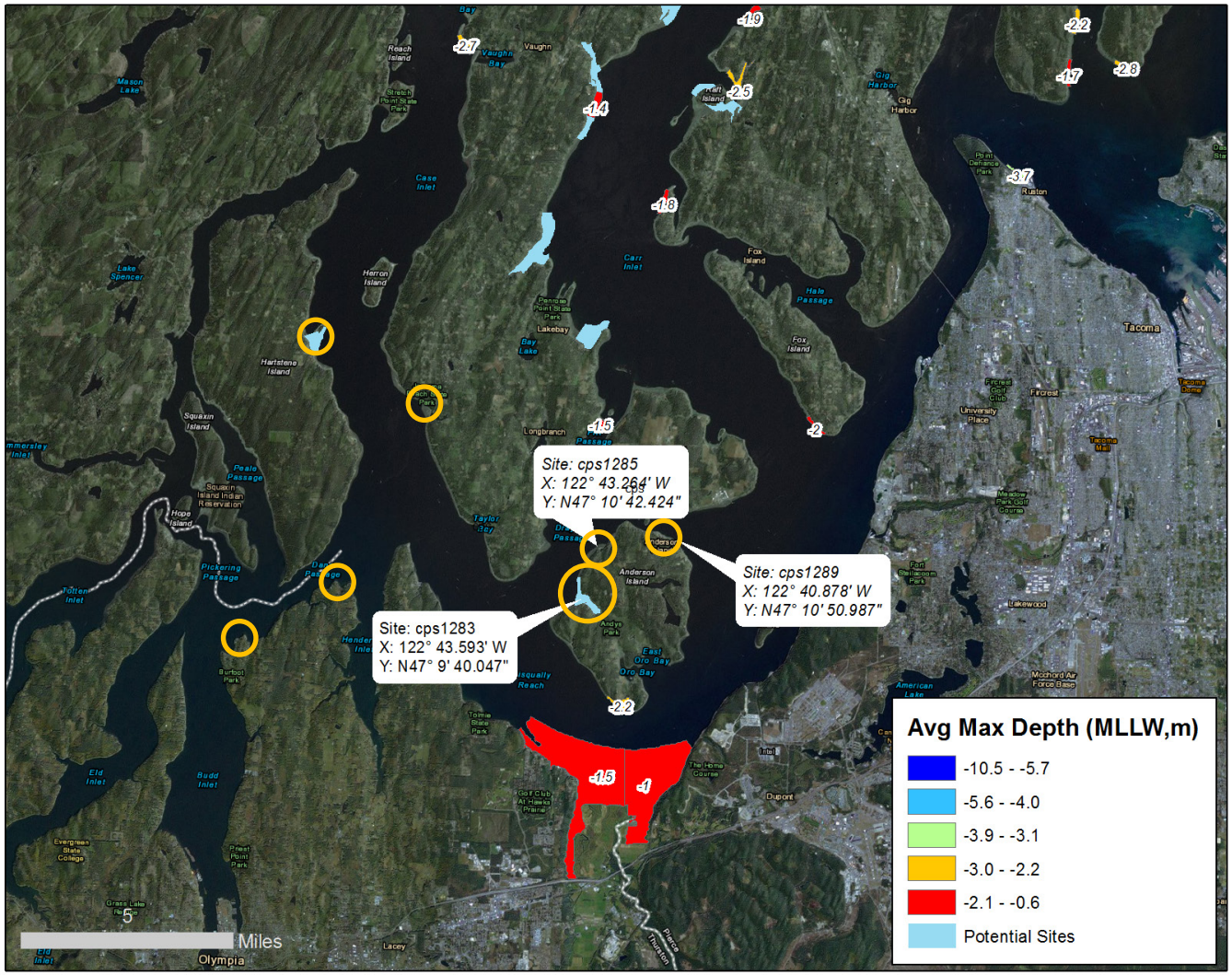


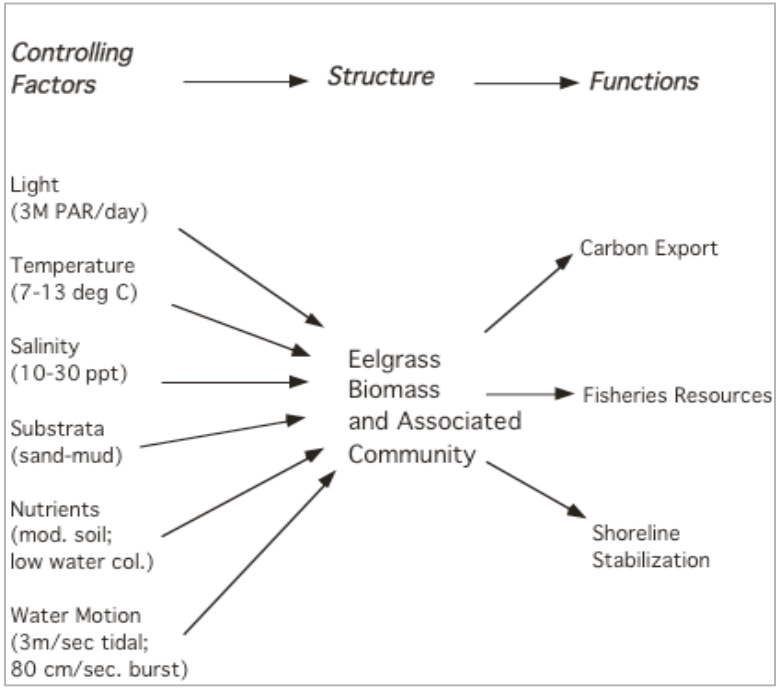
South Sound


Site: cps1285
X: 122° 43.264' W
Y: N47° 10' 42.424"
Site: cps1289
X: 122° 40.878' W
Y: N47° 10' 50.987"
Site: cps1283
X: 122° 43.593' W
Y: N47° 9' 40.047"
Avg Max Depth (MLLW,m)
-10.5 - -5.7
-5.6 - -4.0
-3.9 - -3.1
-3.0 - -2.2
-2.1 - -0.6
Potential Sites
5
Miles
Olympia
Tacoma
Lacey
Dupont
Lakewood
Gig Harbor
Ruston
Fircrest
University Place
Lakebay
Longbranch
Anderson Island
Fox Island
Harstene Island
Squaxin Island
Hope Island
Case Inlet
Carr Inlet
Hale Passage
Pickering Passage
Peale Passage
Totten Inlet
Eld Inlet
Budd Inlet
Vaughn
Vaughn Bay
Mason Lake
Lake Spencer
Bay Lake
Taylor Bay
East Oro Bay
Oro Bay
Joint Base Lewis-McChord
Mcchord Air Force Base
American Lake
-1.9
-2.2
-1.7
-2.8
-2.7
-1.4
-2.5
-3.7
-1.8
-1.5
-2
-2.2
-1.5
-1

Field Visit to Areas of Interest

- Presence/Absence for eelgrass
- Appropriate depth
- Appropriate substrate
- Other site characteristics (ex. fetch, shoreline grade)
- Any obvious potential stressors

Next Step – Acquire Additional Data



Conceptual model showing eelgrass controlling factors with ranges of values (Thom et al. 2005).

- Identify potential sites the model did not select
- Further refine (filter) model outputs
- Assist in prioritizing sites
- Identify known stressor abatement activities that need to be performed prior to restoration
- Address barriers to effective regulation and stewardship of eelgrass

We would like your input

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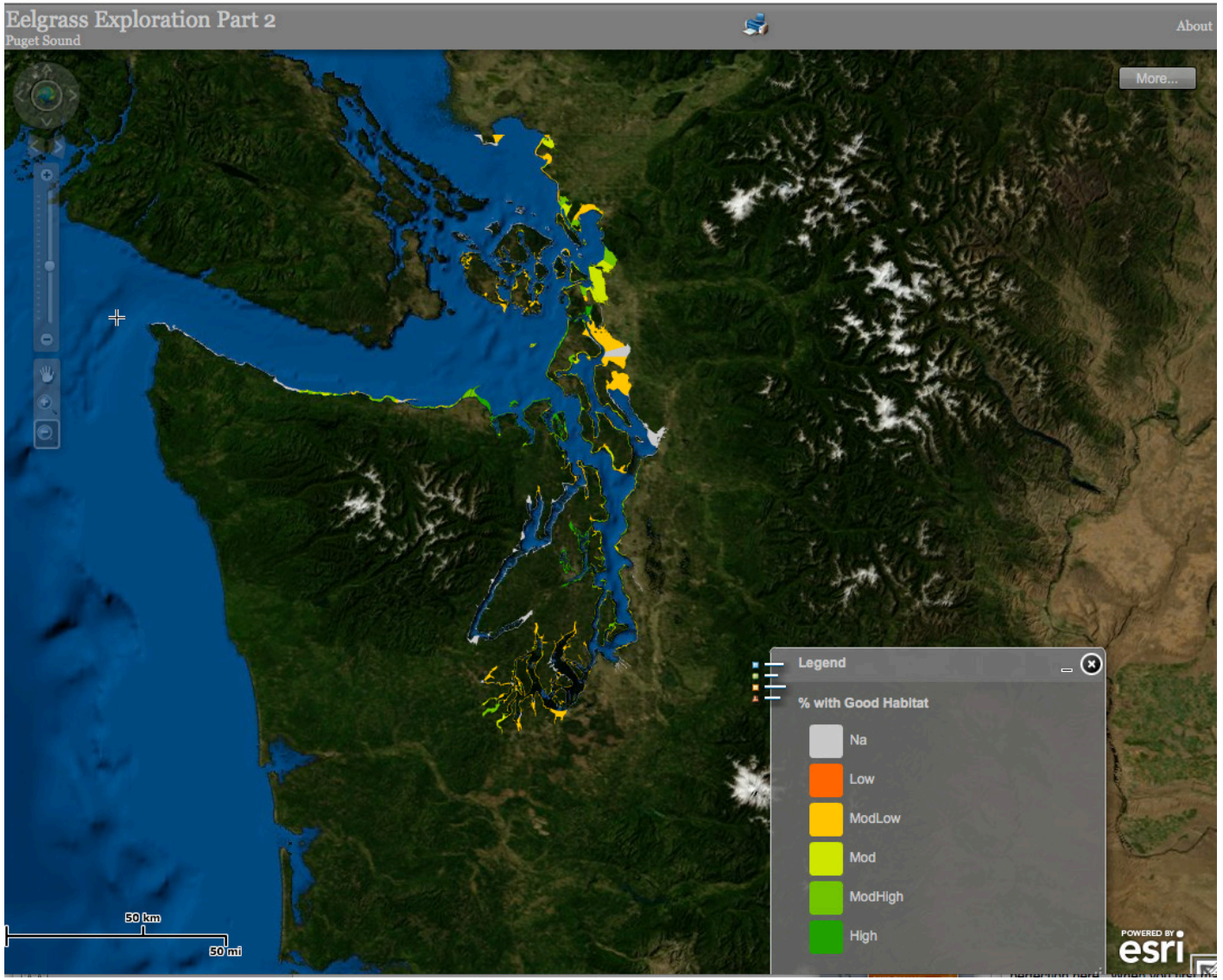

Thank you

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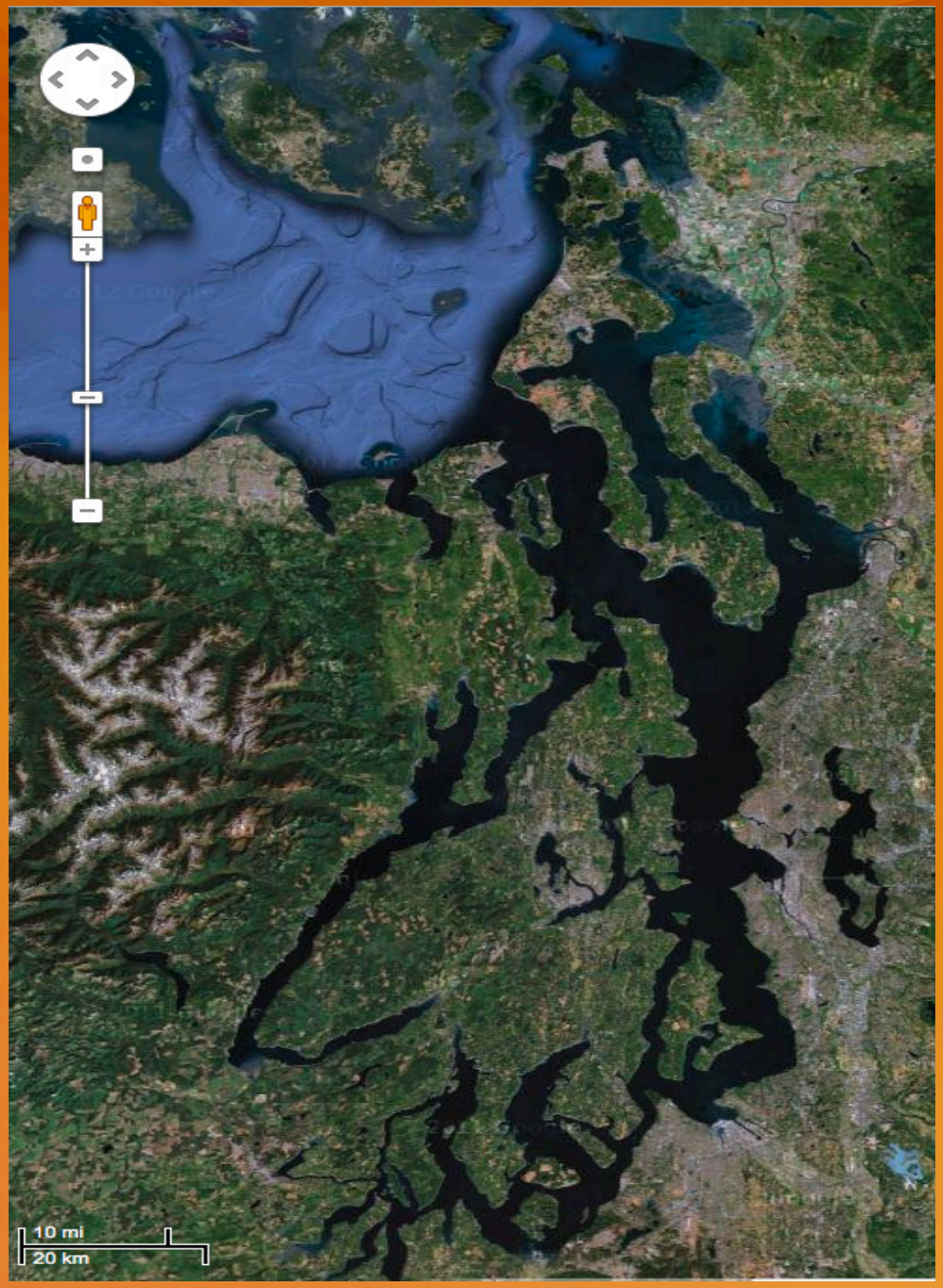

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